

a) hybridizing a nucleic acid sequence in a hydrolyzed sample of cells to a complementary nucleic acid probe to form a double-stranded RNA/DNA hybrid;

b) capturing the hybrid onto a solid phase to which an anti-hybrid antibody or functional anti-hybrid fragment has been immobilized, wherein the antibody or antibody fragment specifically binds to a component of the double-stranded RNA/DNA hybrid forming a bound hybrid;

c) eliminating any non-hybridized probe; and

d) detecting the bound hybrid.

29. (new) The assay of claim 28 wherein the non-hybridized probe is eliminated by digestion with an enzyme.

30. (new) The assay of claim 28 wherein the concentration of probe is between 1 and 500 ng/ml.

31. (new) The assay of claim 28 wherein the concentration of probe is between 20 and 200 ng/ml.

32. (new) The assay of claim 28 wherein the concentration of probe is approximately 75 ng/ml.

33. (new) A solution hybridization kit for the detection of a target nucleic acid sequence for diagnosing genetic defects, microbial or viral infections in a biological sample with an accuracy of at least 89% comprising: